Additional information on this product and answers to frequently asked questions can be found at our Customer Support Website.

http://www.sony.net/

4258762130

SONY

4-258-762-**13**(1)

Interchangeable Lens Digital HD

Video Camera Recorder

Operating Guide



E-mount

HANDYCAM

NEX-VG10E

Interchangeable Lens Digital HD
Video Camera Recorder

NEX-VG10E

WARNING

To reduce fire or shock hazard, do not expose the unit to rain or moisture.

Excessive sound pressure from earphones and headphones can cause hearing loss.

Do not expose the batteries to excessive heat such as sunshine, fire or the like.

CAUTION

Battery pack

If the battery pack is mishandled, the battery pack can burst, cause a fire or even chemical burns. Observe the following cautions.

- Do not disassemble.
- Do not crush and do not expose the battery pack to any shock or force such as hammering, dropping or stepping on it.
- Do not short circuit and do not allow metal objects to come into contact with the battery terminals.
- Do not expose to high temperature above 60°C (140°F) such as in direct sunlight or in a car parked in the sun.
- Do not incinerate or dispose of in fire.
- Do not handle damaged or leaking lithium ion batteries.
- Be sure to charge the battery pack using a genuine Sony battery charger or a device that can charge the battery pack.
- Keep the battery pack out of the reach of small children.
- Keep the battery pack dry.
- Replace only with the same or equivalent type recommended by Sony.
- Dispose of used battery packs promptly as described in the instructions.

Replace the battery with the specified type only. Otherwise, fire or injury may result.

AC Adaptor

- Use the nearby wall outlet (wall socket) when using the AC Adaptor. Disconnect the AC Adaptor from the wall outlet (wall socket) immediately if any malfunction occurs while using your camcorder.
- Do not use the AC Adaptor placed in a narrow space, such as between a wall and furniture.
- Even if your camcorder is turned off, AC power source (mains) is still supplied to it while connected to the wall outlet (wall socket) via the AC Adaptor.

Battery charger

Even if the CHARGE lamp is not lit, the battery charger is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet (wall socket). If some trouble occurs while using the battery charger, immediately shut off the power by disconnecting the plug from the wall outlet (wall socket).

About the power cord (mains lead)

The supplied power cord (mains lead) can be used only with this camcorder.

Notice for customers in the United Kingdom

A moulded plug complying with BS 1363 is fitted to this equipment for your safety and convenience.

Should the fuse in the plug supplied need to be replaced, a fuse of the same rating as the supplied one and approved by ASTA or BSI to BS 1362 (i.e., marked with an or mark) must be used.

If the plug supplied with this equipment has a detachable fuse cover, be sure to attach the fuse cover after you change the fuse. Never use the plug without the fuse cover. If you should lose the fuse cover, please contact your nearest Sony service station.

FOR CUSTOMERS IN EUROPE

ATTENTION

The electromagnetic fields at the specific frequencies may influence the picture and sound of this unit.

This product has been tested and found compliant with the limits set out in the EMC Directive for using connection cables shorter than 3 meters (9.8 feet).

Notice

If static electricity or electromagnetism causes data transfer to discontinue midway (fail), restart the application or disconnect and connect the communication cable (USB, etc.) again.

Notice for the customers in the countries applying EU Directives

The manufacturer of this product is Sony Corporation, 1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan. The Authorized Representative for EMC and product safety is Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Germany. For any service or guarantee matters please refer to the addresses given in separate service or guarantee documents.



Disposal of Old Electrical & Electronic Equipment (Applicable in the European Union and other European countries with separate collection systems)

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human

health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources.

For more detailed information about recycling of this product, please contact your local Civic Office, your household waste disposal service or the shop where you purchased the product.



Disposal of waste batteries (applicable in the European Union and other European countries with separate collection systems)

This symbol on the battery or on the packaging indicates that the battery provided with this product shall not be treated as household waste.

On certain batteries this symbol might be used in combination with a chemical symbol. The chemical symbols for mercury (Hg) or lead (Pb) are added if the battery contains more than 0.0005% mercury or 0.004% lead.

By ensuring these batteries are disposed of correctly, you will help prevent potentially negative consequences for the environment and human health which could otherwise be caused by inappropriate waste handling of the battery. The recycling of the materials will help to conserve natural resources.

In case of products that for safety, performance or data integrity reasons require a permanent connection with an incorporated battery, this battery should be replaced by qualified service staff only. To ensure that the battery will be treated properly, hand over the product at end-of-life to the applicable collection point for the recycling of electrical and electronic equipment.

For all other batteries, please view the section on how to remove the battery from the product safely. Hand the battery over to the applicable collection point for the recycling of waste batteries.

For more detailed information about recycling of this product or battery, please contact your local Civic Office, your household waste disposal service or the shop where you purchased the product.

For customers in the U.S.A.

If you have any questions about this product, you may call:

Sony Customer Information Center 1-800-222-SONY (7669).

The number below is for the FCC related matters only.

Regulatory Information

Declaration of Conformity

Trade Name: SONY

Model No.: NEX-VG10E

Responsible Party: Sony Electronics Inc.

Address: 16530 Via Esprillo, San Diego, CA 92127 U.S.A.

Telephone Number: 858-942-2230

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

The supplied interface cable must be used with the equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

Battery pack

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Table of contents

Getting started

Recording and playback

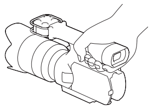
Editing on the computer

Additional information

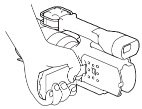
Read this first

To prevent the camcorder from malfunctions and damages

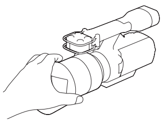
- Do not hold the camcorder by the following parts, and jack covers.



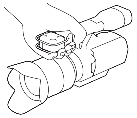
Viewfinder



LCD panel



Lens

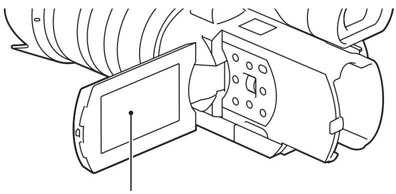


Built-in microphone

- This camcorder is neither dust-proof, nor splash-proof, nor water-proof. See “Precautions” (page 36).

Notes on the viewfinder, LCD monitor and lens

- A menu item that is grayed out is not available under the current recording or playback conditions.
- The viewfinder and the LCD monitor are manufactured using extremely high-precision technology so over 99.99 % of the pixels are operational for effective use. However, there may be some tiny black points and/or bright points (white, red, blue or green in color) that constantly appear on the viewfinder and the LCD monitor. These points are normal in the manufacturing process and do not affect the images in any way.



Black, white, red, blue and green points

- Do not record the sun or leave the camcorder under the sun for a long time. The inside of the camcorder may be damaged. If sunlight is focused on a nearby object, it may cause a fire. When you must place the camcorder under direct sunlight, attach the lens cap.
- Do not expose your camcorder’s viewfinder, lens, or LCD monitor to the sun or strong light source for extended periods.
- Do not attempt to record the sun directly. Doing so may cause a malfunction of the camcorder. You may record a sunset, as the light is not as strong as that at midday.

Notes on recording/playback

- When you use a memory card with this camcorder for the first time, it is recommended to format the memory card using the camcorder for stable performance of the memory card before shooting. Note that formatting permanently erases all data on the memory card, and is unrecoverable. Save precious data on a computer, etc.
- Before you record one-time events, make a trial recording to make sure that the camcorder is working correctly.
- The recorded contents cannot be compensated for even if recording or playback is not possible due to a malfunction of the camcorder or memory card, etc.
- TV color systems differ depending on the countries/regions. To view your recordings on a TV, you need a PAL system-based TV.
- Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the copyright laws.
- Do not do any of the followings when the (movie)/ (still image) mode lamps (page 22) and the access lamp (page 21) are lit or flashing. Otherwise, the recording media may be damaged, recorded images may be lost or other malfunctions could occur.
  – ejecting the memory card
  – removing the battery pack or the AC Adaptor from the camcorder
- Do not look at the sun or a strong light through a removed lens. This may cause irrecoverable damage to your eyes. Or, it may cause a malfunction of the lens.
- Do not shake or strike the camcorder. In addition to malfunctions and an inability to record images,

this may render the memory card unusable, or cause image data breakdown, damage or loss.
- When carrying the camcorder with a shoulder strap (sold separately) attached, there may be a tendency to hit the camcorder against something. Pay extra attention not to do so.

Discs recorded with high definition image quality (HD)

This camcorder captures high definition footage in the AVCHD format. DVD media containing AVCHD footage should not be used with DVD based players or recorders, as the DVD player/recorder may fail to eject the media and may erase its contents without warning.
A DVD recorded with high definition image quality (HD) is called an "AVCHD disc" in this manual.

To protect the data of recorded images

- To avoid the potential risk of data loss, always copy (back up) data to other medium.
- You cannot create an AVCHD disc from a movie recorded with [FX 24M] mode of [Rec Mode]. Save a movie recorded with [FX 24M] mode onto a Blu-ray Disc.

Notes on the battery pack and AC Adaptor

- Disconnect the battery pack and AC Adaptor after turning off the camcorder.
- When disconnecting the AC Adaptor from the camcorder, hold both of the DC plug and the camcorder.

Notes on the temperature of the camcorder and battery pack

The camcorder has a protective function that disables recording or playback if the temperature of the camcorder or battery pack is beyond the safely operable range. In this case, a message appears on the LCD monitor or in the viewfinder.

Operating instructions

The camcorder comes with 2 manuals: "Operating Guide" (this manual) which explains the basic operations, and ""Handycam" Handbook (PDF)" which explains the functions of the camcorder in detail and disc creation methods.

Operating Guide

Contains the following topics as the basic operations:
Preparation of the camcorder, recording, playback, preparation of the computer, importing the image to a computer.

"Handycam" Handbook (PDF)

Contains the following topics so that you will understand the functions of the camcorder in detail.
Detailed explanation of the menu, disc creation using a computer and recorder

To read the "Handycam" Handbook

- Install the "Handycam" Handbook from the supplied CD-ROM.
  When using a Windows computer, on the installation screen displayed, click [Handbook] → the desired language → the model name of your camcorder → [Install]. Then, follow the instructions on the screen.
  The shortcut will appear on the screen.
- When using a Macintosh, open the [Handbook] → [GB] folder on the supplied CD-ROM, then copy [Handbook.pdf].
- You need Adobe Reader to read "Handycam" Handbook.
  http://www.adobe.com/

The visual world seen by your NEX-VG10E



The large-sized image sensor

The camcorder is equipped with an APS-C-sized (23.4 mm × 15.6 mm) CMOS image sensor.
Its sensor area is about 20 times as large as the 1/3-inch image sensor that is often used in existing video cameras.
The larger the image sensor, the shallower the depth of field. This allows you to reduce the focus on the background in order to make the subject stand out.

Interchangeable lens system

The camcorder employs the E-mount system for interchangeable lenses developed by Sony.
The supplied E-mount lens has an optical camera-shake compensation mechanism (Active mode), and can also zoom up to 11 times.
Using a Mount Adaptor (sold separately) enables you to use α lenses (A-mount lenses) as well. You can choose the right lens for the recording conditions or subjects. A wide variety of characteristic lenses will widen visual expression.

Manual operability

The camcorder allows you to use aperture priority/shutter speed priority/full-manual exposure compensation, and adjust gain, white balance, etc. for recording movies.
A control dial and exclusive buttons are provided to enable you to use the camcorder in your own way, more comfortably.

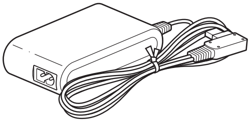
High-performance microphone

The camcorder adopts an array microphone system that has a four-capsule structure.
The camcorder creates the correct sound localization by processing the signal from the microphone, achieves both realistic sensation and front localization, and records low-noise and clear sound. The high-performance microphone will make full high-definition movies more appealing.

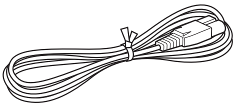
Accessories supplied

The number in parentheses indicates the number of pieces supplied.

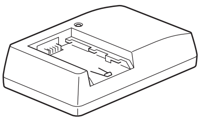
AC Adaptor AC-PW10AM/AC-PW10 (1)



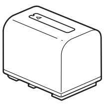
Power cord (mains lead) (2)



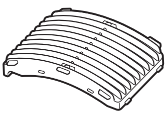
Battery charger BC-VH1 (1)



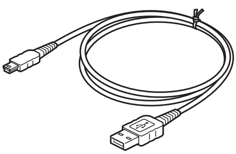
Rechargeable battery pack NP-FV70 (1)



Battery cover (1)



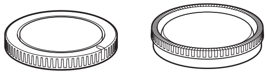
USB cable (1)



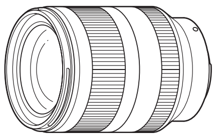
Wind Screen (1)



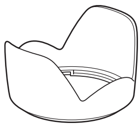
Body cap (1)/Rear lens cap (1)



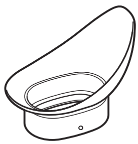
Telephoto zoom lens (E18-200 mm F3.5-6.3 OSS) (1) (Front lens cap included) (attached to the camcorder)



Lens hood (1)



Large eyecup (1)



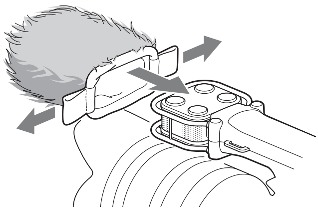
CD-ROM “Handycam Application Software” (1)
- “PMB”
- “Handycam” Handbook

Operating Guide (1)

Attaching the accessories

Wind Screen

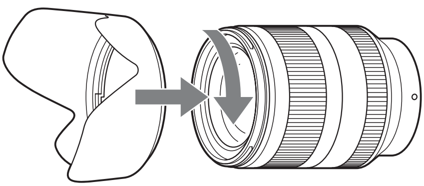
Use the Wind Screen when you want to reduce the wind noise recorded by the microphone. Attach the Wind Screen with the Sony logo facing down.



Lens hood

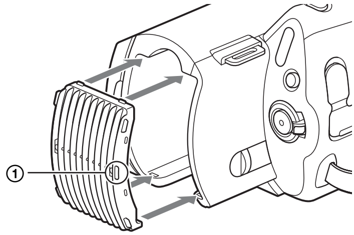
Align the red line of the lens hood to that of the lens and mount the lens hood on the lens. Turn the lens hood clockwise until the red dot of the lens hood and that of the lens align with a click.

- When shooting still images using a flash (sold separately), remove the lens hood to prevent the flash light from being blocked.
- When storing the lens hood after recording, attach the lens hood facing the other way round on the lens.



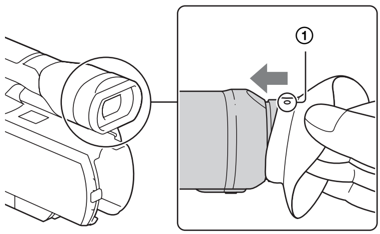
Battery cover

Attach the battery cover with the projecting part (①) facing as shown in the illustration.



Large eyecup

When the image in the viewfinder is hard to see, use the large eyecup.
To attach the large eyecup, align it with the eyecup groove of the viewfinder with the projecting part (①) at the top.

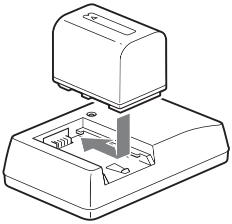


Preparing the battery

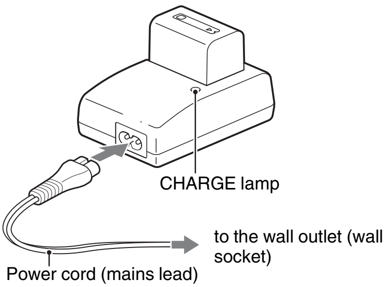
Charging the battery pack

Charge the battery pack using the supplied battery charger. You cannot charge the battery pack attached on the camcorder.

1 Insert the battery pack into the battery charger.



2 Connect the battery charger to the wall outlet (wall socket).
The CHARGE lamp lights up.
Lit: The battery is being charged.
Off: Normal charge is completed.
An hour after off: Full charge is completed.



Charging time

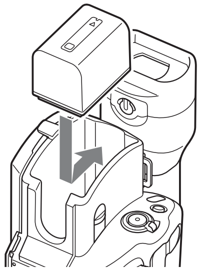
The following table shows the charging time in minute required to charge a fully depleted battery pack at a temperature of 25 °C (77 °F). The charging time varies depending on the operating conditions. See page 35 on the recording time available.

Battery pack	Full charge	Normal charge
NP-FV70 (supplied)	550	490
NP-FV100	960	900

• We recommend charging the battery pack in an ambient temperature of between 10 °C and 30 °C (50 °F and 86 °F). You may not be able to efficiently charge the battery pack outside of this temperature range.

Attaching the battery pack

Press the battery pack against the back of the camcorder, and slide it up until it clicks.



Checking the remaining battery level

Check the level with the following indicators displayed on the LCD monitor or viewfinder.

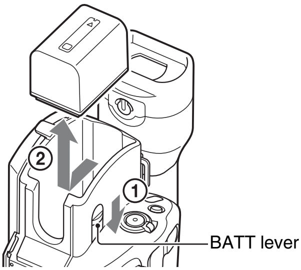
Battery level	
	High
	
	
	
	Low
“Battery exhausted”	You cannot record any more images.

Note

• The displayed level may not be correct under certain circumstances.

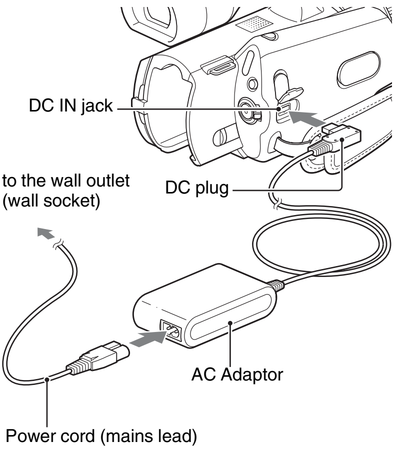
Removing the battery pack

Turn off the camcorder. While pressing the BATT lever (①), remove the battery pack (②).



Using the wall outlet (wall socket) as a power source

Connect the power cord (mains lead) to the AC Adaptor, and connect the AC Adaptor to the camcorder and the wall outlet (wall socket).
Align the ▲ mark on the DC plug with that on the DC IN jack.



Note

- You cannot charge the battery pack attached on the camcorder by connecting the AC Adaptor.

Using the camcorder abroad – Power source

You can use the battery charger and the AC Adaptor in any countries/regions where the power supply is within AC 100 V to 240 V, 50 Hz /60 Hz.

Note

- Do not use an electronic transformer (travel converter), as this may cause a malfunction.

Notes on the battery

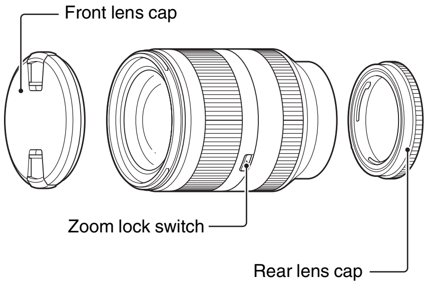
- When you remove the battery pack and the AC Adaptor, make sure that the power switch is set to OFF, and the 🎞 (movie)/ 📷 (still image) lamps are turned off.
- The CHARGE lamp of the battery charger may flash in the following situations:
  - The battery pack is not attached correctly.
  - The battery pack is damaged.
  - The battery pack is too cold.
    Remove the battery pack, and keep it in a warm place.
  - The battery pack is too warm.
    Remove the battery pack, and keep it in a cool place.
- You cannot use NP-FV30/FV50 battery packs with this camcorder.

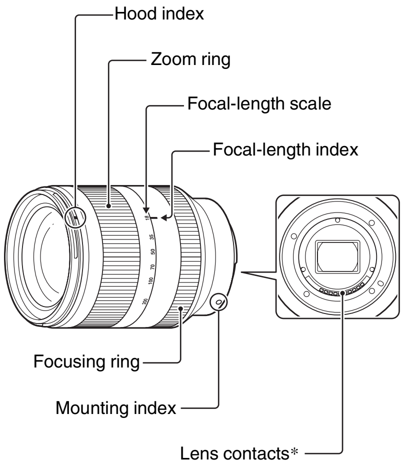
Notes on the battery charger and the AC Adaptor

- Do not short-circuit the battery terminal of the battery charger or the DC plug of the AC Adaptor with any metallic objects. This may cause a malfunction.
- Use the battery pack after a normal charge or full charge is completed.
  - If you use a different battery charger (sold separately), the battery remaining indicator of the battery charger may not indicate a correct figure when using the battery pack with this camcorder.
  - If you charge a battery pack that has been used at least once with this camcorder on a battery charger having a function to indicate the usable time, "—" will be displayed instead.

Attaching a lens

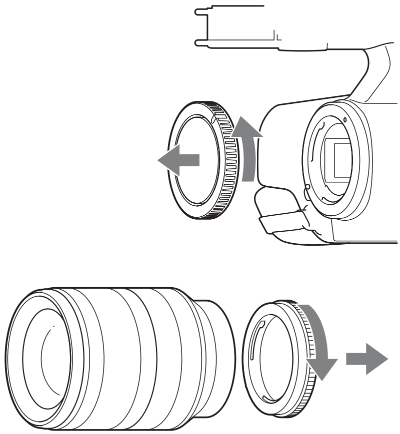
This manual explains how to attach a lens using the supplied E18-200 mm F3.5-6.3 OSS lens. Hold the camcorder body with the front end downward, and quickly change the lens somewhere away from dusty locations so as to keep dust or debris from getting inside the camcorder body.



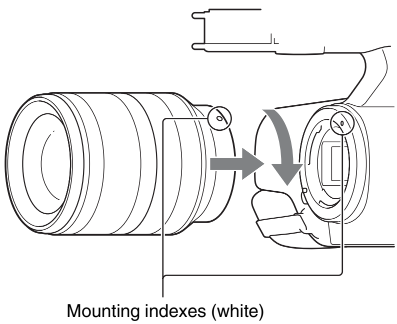


* Do not touch or dirty the lens contacts.

1 Remove the body cap from the camcorder body and the packaging lid from the rear of the lens.



2 Mount the lens by aligning the mounting indexes (white) on the lens and the camcorder body. While pushing the lens lightly toward the camcorder body, turn the lens clockwise until it clicks into the locked position.
Be sure to put the lens on straight.

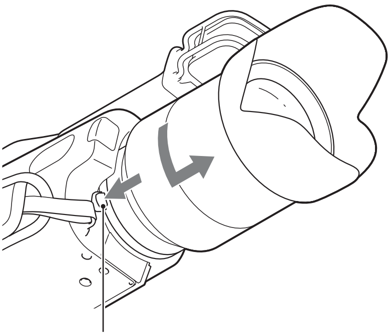


Notes

- When attaching a lens, do not press the lens release button.
- Do not use force when attaching a lens. Mounting the lens forcibly may result in a malfunction or damage of the lens mount.
- You need a Mount Adaptor (sold separately) to use an A-mount lens (sold separately). For details on a Mount Adaptor, refer to the operating manual supplied with the Mount Adaptor.

Removing the lens

1 Press the lens release button all the way in and turn the lens counterclockwise until it stops. Hold both the lens and the camcorder body when removing a lens.



Lens release button

2 Replace the packaging lid on the lens and attach the body cap to the camcorder body. Before you attach them, remove dust from them.

Notes

- When changing the lens, if dust or debris gets inside the camcorder body and adheres to the surface of the image sensor (the part that acts as the film), it may appear on the image, depending on the shooting conditions. The camcorder body vibrates slightly when it is turned off, due to the anti-dust function, to prevent dust from adhering to the image sensor. However, attach or remove the lens quickly somewhere away from dusty locations.
- Do not leave the camcorder body with the lens and lens cap removed.

If dust or debris adheres on the image sensor

Clean the image sensor using [Cleaning Mode] on the [Setup] menu. Then, turn off the camcorder and detach the lens. Clean the image sensor and the surrounding area using a blower (sold separately), and then reattach the lens.

Notes

- Cleaning can be performed only when the battery level is (3 remaining battery icons) or more. We recommend that you use the AC Adaptor.
- Do not use a spray blower because it may scatter water droplets inside the camcorder body.
- Do not put the tip of a blower into the cavity beyond the mount, so that the tip of the blower does not touch the image sensor.
- Hold the camcorder's face downward to prevent the dust from resettling in the camcorder.
- Do not apply a mechanical shock to the camcorder during cleaning.
- If you cannot clean the image sensor by the above procedure, consult your Sony dealer or local authorized Sony service facility.

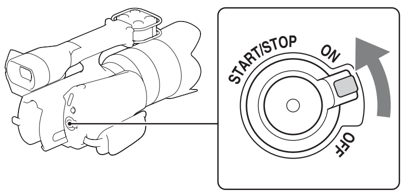
A-mount lenses

You may not be able to use certain A-mount lenses. For the compatibility of a particular A-mount lens, visit the Sony web site in your area, or consult your Sony dealer or local authorized Sony service facility.

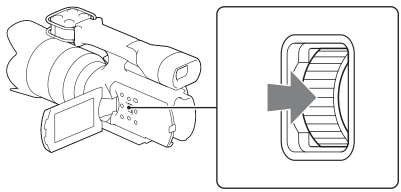
Turning on the camcorder and setting the date and time

When you turn on the camcorder for the first time, the screen to set date and time appears.

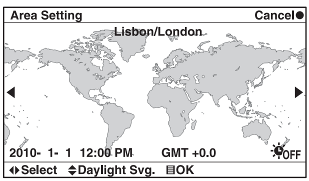
1 While holding the green button down, set the power switch to ON.
The camcorder is turned on, and the screen to set date and time appears on the LCD monitor.



2 Press the control dial to confirm [OK].

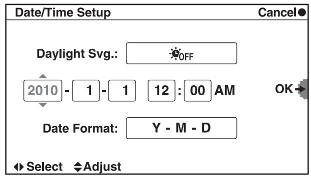


3 Select your area by pressing ◀/▶ and press the control dial.



4 Select an item to be set with ◀/▶.

5 Turn the control dial to select the numeric value.
You can also use ▲/▼ for the selection.



Daylight Svg.: Turns on or off the daytime saving time setting.
Date Format: Selects the format to display date.
Midnight is indicated as 12:00 AM, and noon as 12:00 PM.

6 Repeat steps 4 and 5 to set other items, and then press the control dial.

To turn off the camcorder

Set the power switch to OFF.

To reset the date and time/to check the current clock setting

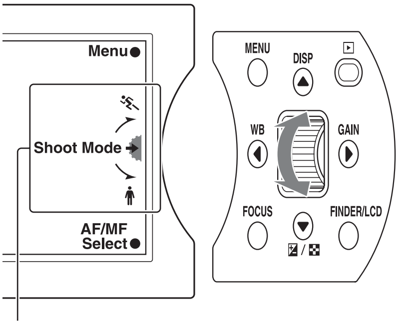
Press MENU, then select [Setup] → [Date/Time Setup].

Changing the language setting

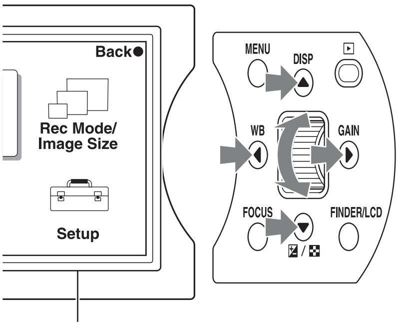
You can change the on-screen displays to show messages in a specified language.
Press MENU, then select [Setup] → [A Language] → desired language.

Using the operating buttons

You can select setting items by turning the control dial or pressing the ▲/▼/◀/▶ buttons following the instructions on the display. Your selection is determined when you press the control dial.
In addition to the above, the ▲/▼/◀/▶ buttons are assigned with functions that will be used frequently during recording or playback (page 24).

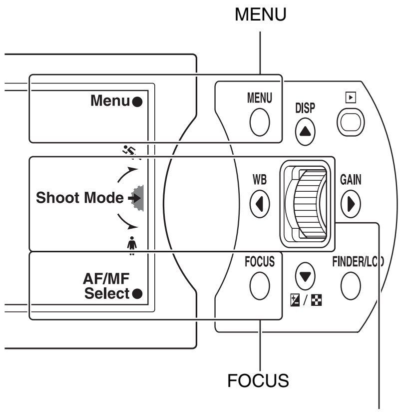


The arrow means you can turn the control dial.



When options are displayed on the screen, you can browse through them by turning the control dial or pressing the ▲/▼/◀/▶ buttons.
Press the control dial to make your choice.

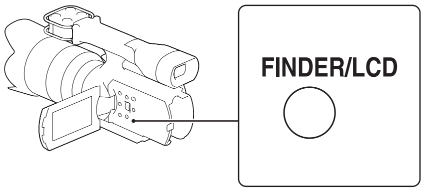
The MENU and FOCUS buttons and the control dial have different roles, depending on the screen display. The assigned role (function) of each button is shown on the screen.
To use the function shown at the upper right corner of the screen, press the MENU button. To use the function shown at the center, press the control dial.
To use the function shown at the lower right corner of the screen, press the FOCUS button.
In this manual, the buttons are indicated by the icon or the function shown on the screen.



In this case, the MENU button works as [Menu], and the control dial as [Shoot Mode], and the FOCUS button as [AF/MF Select].

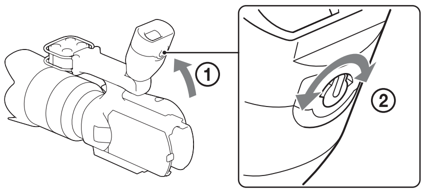
Adjusting the viewfinder and the LCD monitor

Images are displayed on the viewfinder or the LCD monitor.
Press FINDER/LCD to select whether you want to display the image on the viewfinder or the LCD monitor.



Viewfinder

Adjust the angle to your preference (①), and move the viewfinder lens adjustment lever until the image becomes clear (②).



Note

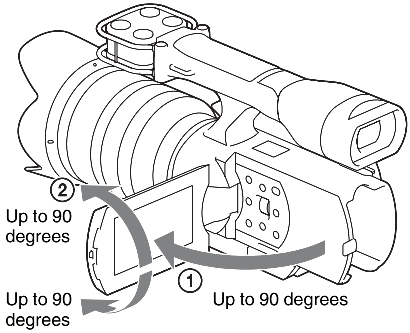
- You may see primary colors shimmering in the viewfinder when you move your line of sight. This is not a malfunction. The shimmering colors will not be recorded on the memory card.

Tip

- You can adjust the brightness of viewfinder with [Viewfinder Bright.] on the menu.

LCD monitor

Open the LCD monitor (①), then rotate it to your preference (②).



Note

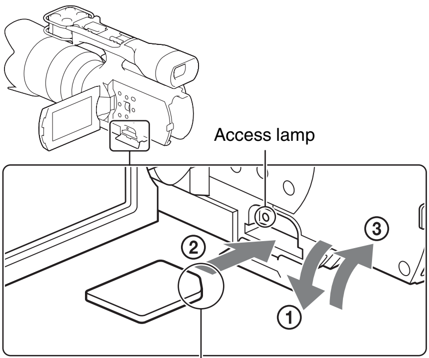
- The LCD monitor rotates up to 90 degrees in the vertical direction. Do not try to rotate it further. Doing so may damage the LCD monitor.

Tip

- You can adjust the brightness of LCD monitor with [LCD Brightness] on the menu.

Inserting a memory card

Open the cover (①). Insert the memory card with the notched corner faced as illustrated below (②) until it clicks. Close the cover (③).



When you insert a new memory card

If [Image Database File not found. Create?] is displayed, press the control dial.

Notes

- If you force the memory card into the slot in the wrong direction, the memory card, the memory card slot, or image data may be damaged.
- Do not attach a label, etc. on a memory card or a card adaptor. This may cause a malfunction.

Tip

- See page 35 for the available recording time.

To eject the memory card

Open the cover, make sure that the access lamp is not lit, and push the memory card once.

Notes

- Do not open the cover during recording.
- When inserting or ejecting the memory card, be careful so that the memory card does not pop out and drop.

Memory cards that you can use

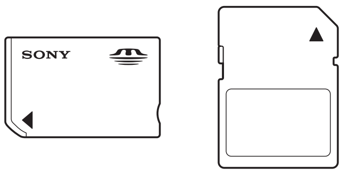
- You can use following memory cards with this camcorder. However, this does not mean that all these memory cards are guaranteed to work with the camcorder.
  – “Memory Stick PRO Duo” (Mark2) media
  – “Memory Stick PRO-HG Duo” media
  – SD memory card (Class 4 or more)
  – SDHC memory card (Class 4 or more)
  – SDXC memory card (Class 4 or more)
- It is confirmed that up to 32 GB of “Memory Stick PRO Duo” media and up to 64 GB of SD card can be used with this camcorder.
- “Memory Stick PRO Duo” media and “Memory Stick PRO-HG Duo” media are both called as “Memory Stick PRO Duo” media, and SD memory card, SDHC memory card and SDXC memory card are all called as “SD card” in this manual.

Notes

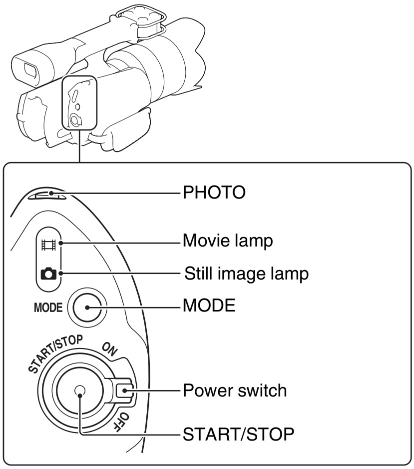
- You cannot use MultiMediaCard.
- Images recorded on an SDXC memory card cannot be imported to or played on computers or AV devices that are not compatible with exFAT*. Make sure that the device is compatible with exFAT before connecting it to the camcorder. If you connect your camcorder to an incompatible device, you may be prompted to format the card. Never format the card in response to this prompt, as doing so will erase all data on the card.
  * exFAT is the file system used on SDXC memory cards.

The size of memory card you can use

You can use only “Memory Stick PRO Duo” media which are about the half size of standard “Memory Stick” media, or standard-size SD cards, with your camcorder.



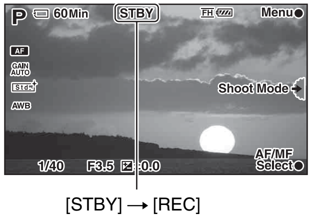
Recording



Movies

1 While holding the green button down, set the power switch to ON.

2 Press START/STOP.



To stop recording, press START/STOP again.

Notes

- The camcorder can record movies for about 13 hours continuously.
- If a movie file exceeds 2 GB during recording, the camcorder divides the file and create a new file automatically.
- Since the camcorder is writing data on the memory card in the following status, do not shake or knock your camcorder, or remove the battery pack or the AC Adaptor.
  - When the access lamp is lit or flashing
  - When the recording icon is displayed
- The camcorder does not have the power zoom function.
- Hold the lens with your left hand during recording (when you do not use a tripod). Make sure that your fingers are not touching the microphone.

Tips

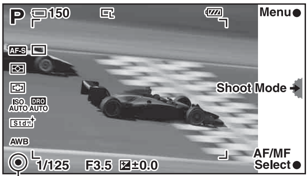
- If you do not want the sound of the camcorder and the lens in operation to be recorded with movies, you can disable the sound recording. Press MENU, then select [Setup] → [Movie Audio Rec] → [Off].
- To change the image quality of movies, press MENU, then select [Rec Mode/Image Size] → [Rec Mode].

Still images

1 While holding the green button down, set the power switch to ON.

2 Press MODE to turn on the 📷 (still image) lamp.

3 Press PHOTO lightly to adjust the focus, then press it fully.



Focus indicator

Focus indicator

The focus indicator shows the focusing status by lighting, flashing, or changing the shape.

● lit: Focus locked.

(◉) lit: Focus is confirmed. Focal point moves following a moving subject.

( ) lit: Still focusing.

● flashing: The camcorder cannot focus on the subject automatically. Either recompose the shot or change the focus setting.

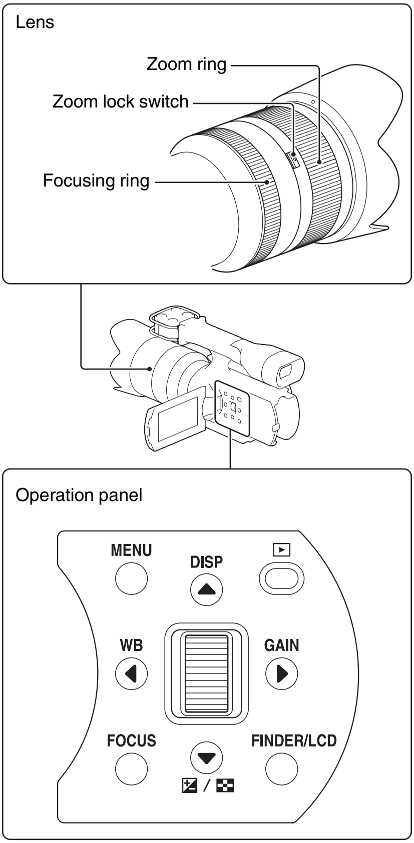
Notes

- You cannot shoot still images in movie recording mode.
- The camcorder is unable to take images in the portrait position, which is available on digital SLR cameras.
- Focusing may be difficult in the following situations:
  - It is dark and the subject is distant.
  - The contrast between the subject and the background is poor.
  - The subject is seen through glass.
  - The subject is moving quickly.
  - The subject reflects light such as mirror, or has shiny surfaces.
  - The subject is flashing.
  - The subject is backlit.

Tip

- To change the image size of still images, press MENU, then select [Rec Mode/Image Size] → [Image Size].

Recording functions



Adjustments using the lens

The operations and operating methods available depend on the lens attached. The following operations are available with the lens supplied with your camcorder.

Zoom ring

Turn the zoom ring right or left to decide on the size of the subject in your image. Zooming must be done before focusing.

Note

- Do not grab or apply a strong force to the lens cylinder that rolls out when zooming. The lens may be damaged.

Focusing ring

In the manual focus mode, turn the focusing ring right or left to bring the subject into focus.

Zoom lock switch

This switch prevents the lens cylinder from being extended by its own weight when it is being transported, etc. Turn the zoom ring back toward the W-end, and slide the switch toward ▼ to lock it. To unlock it, set the switch to the original position.

Settings using the operation panel

The menu allows you to set various functions. Functions that will be used frequently are assigned to the following buttons.

MENU

This button displays the menu. The menu allows you to change the settings of the camcorder, and use various functions. See page 42 for the menu list.

DISP

This button switches the information displayed on the screen during recording or playback.
Recording mode
(Disp. Basic Info/Histogram/No Disp. Info.)
Playback mode
(Disp. Basic Info/Disp. Detail Info/No Disp. Info.)

WB

This button allows you to select a white balance setting according to the ambient light conditions. It also allows you to adjust the white balance to your preference.
(Auto WB/Daylight/Shade/Cloudy/Incandescent/Fluorescent/Flash/C.Temp./Filter/Custom/Custom Setup)

GAIN

Movie mode: Sets the gain.
This button allows you to increase the gain when recording in dim places. Select the desired gain value when you do not want the gain to be increased with the [Auto] setting.
(Auto/ 0dB to 27dB)
The camcorder sets a Gain between 0 dB and 21 dB atutomatically with [Auto].
Still image mode: Sets the ISO sensitivity.
This button allows you to set the luminous sensitivity for recording still images.
(ISO AUTO/200 to 12800)
The camcorder sets an ISO between ISO 200 and ISO 1600 automatically with [ISO AUTO].



This button allows you to compensate for the brightness of the entire image (exposure compensation).
(–2.0EV to +2.0EV)



This button displays the image list in playback mode.

FOCUS

This button switches the focusing mode.
(Autofocus/DMF*/Manualfocus)

FINDER/LCD

This button determines where to display the image.
(Viewfinder/LCD monitor)



This button plays back images.

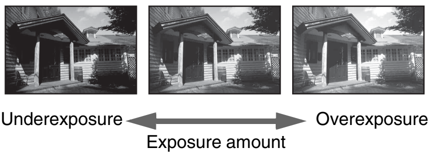
* Still image only

Exposure mode

Adjusting the shutter speed and the aperture will widen the range of visual expression.

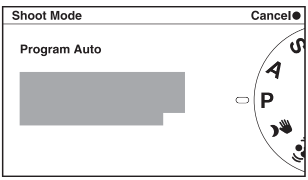
Visual expression is enhanced by a combination of the shutter speed and aperture setting. The movement of the subject and the way the subject is focused on are determined by the shutter speed and aperture setting. At the same time, the shutter speed and aperture setting determines the image brightness by compensating for the exposure, which is the amount of light captured by the image sensor, and is the most important factor for image enhancement.

Brightness by changing the amount of exposure



For example, light can be captured for a shorter time at a faster shutter speed, when the shutter opens for a shorter time. As a result, the image will be darker. In order to make an image brighter, it is necessary to compensate for the lack of light by opening the aperture so that more light is captured while the shutter is open.
"Exposure" is the brightness adjustment done for recording images by a combination of shutter speed and aperture, as described above.
This camcorder has 4 exposure modes, [Program Auto], [Aperture Priority], [Shutter Priority], and [Manual Exposure]. You can select a mode as follows.

1 Press the control dial.



2 Turn the control dial to select a desired mode, then press it.

Program Auto (P)

This mode adjusts the aperture and shutter speed automatically, and allows you to set Gain/ISO, Creative Style, White Balance, etc., to meet your needs.

Aperture Priority (A)

This mode allows you to adjust the aperture value by turning the control dial. The shutter speed is adjusted automatically.
- Opening the aperture allows you to put the subject in sharp focus and blur things in front of and beyond the subject. The more the aperture is opened, the narrower the focused range becomes. (Depth of field becomes shallower.)
- Narrowing down the aperture allows you to shoot the depth of the scenery. The less the aperture is opened, the wider the focus range from front to back becomes. (Depth of field becomes deeper.)

Shutter Priority (S)

This mode allows you to adjust the shutter speed by turning the control dial. The aperture is adjusted automatically.
- When a faster shutter speed is used, a moving subject such as a running person, cars, and sea spray appears as if they are stopped.
- When a slower shutter speed is used, a trailing image of the movement of the subject is captured to make more natural and dynamic image.

Manual Exposure (M)

This mode allows you to set a desired exposure by adjusting both aperture and shutter speed. Select either item by pressing ▼, and set the a desired value by turning the control dial.

Available manual setting in each exposure mode (using an E-mount lens)

Manual setting	Exposure mode			
	A	S	M	P
Aperture	✓	–	✓	–
Shutter speed	–	✓	✓	–
Gain/ISO sensitivity	✓	✓	✓	✓
Exposure compensation	✓	✓		✓

✓: Can be set in standby mode and during recording
–: Sets automatically

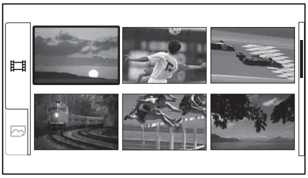
A-mount lenses

You may not be able to use certain A-mount lenses. For the compatibility of a particular A-mount lens, visit the Sony web site in your area, or consult your Sony dealer or local authorized Sony service facility.

Playback

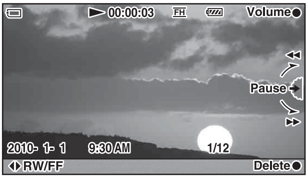
Playback from movie recording mode

1 Press ▶ (Playback).
The index screen appears.



To view still images, select (still image) by pressing ◀/▼, and press the control dial.

2 Press ▲/▼/◀/▶ to select the image you want to play back, and press the control dial.

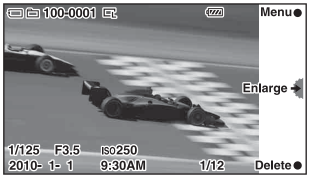


Playback operations

Pause	Press the control dial.
Fast-forward	Press ▶, or turn the control dial down.
Fast-reverse	Press ◀, or turn the control dial up.
Slow-forward	Pause and turn the control dial down.
Slow-reverse	Pause and turn the control dial up.
Adjust sound volume	Press MENU, and adjust with ▲/▼.
Exit	Press ▶ (Playback).

Playback from still image recording mode

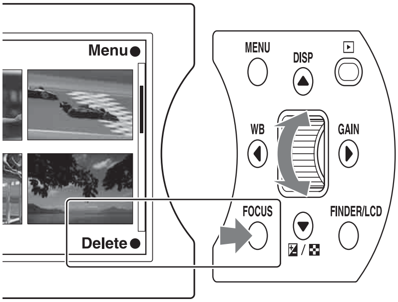
1 Press ▶ (Playback).
The single image screen appears.



2 Press ◀/▶ to select the image you want to play back.
Press the control dial to enlarge the image.
Press ▼ (/) to display the index screen.

Deleting an image

Select the image you want to delete. Press FOCUS, and the control dial.



Tip

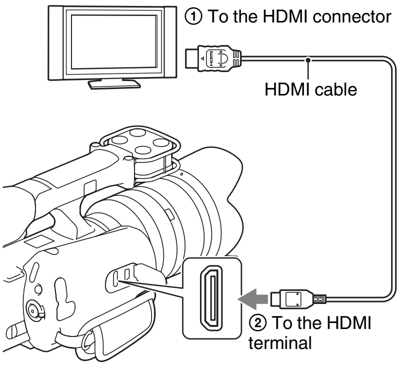
- You can select images to be deleted. Press MENU, then select [Playback] → [Delete] → [Multiple Movies]/[Multiple Still Images].

Playback on a TV

To view images recorded on the camcorder on a TV, an HDMI cable (sold separately) and an HD TV equipped with an HDMI connector are required. Refer also to the operating instructions supplied with the TV.

1 Turn off both the camcorder and the TV.

2 Connect the camera to the TV with an HDMI cable (sold separately).



3 Turn on the TV and switch the input.

4 Turn on the camcorder, and press ▶ (Playback).
Images recorded with the camcorder appear on the TV screen.
Select the desired image with ▲/▼/◄/► and the control dial.

Notes

- Use an HDMI mini connector on one end (for the camcorder), and a plug suitable for connecting your TV on the other end.
- No image is displayed on the viewfinder and LCD monitor when signals are output via the HDMI terminal.
- Some devices may not work properly.
- Use an HDMI cable with the HDMI logo.
- Do not connect the output connector of the device with the HDMI terminal on the camcorder. This may cause a malfunction.
- Signals can be output from the camcorder to a TV only via the HDMI terminal.
- This camcorder is not compatible with "BRAVIA" Sync.

On "PhotoTV HD"

This camcorder is compatible with the "PhotoTV HD" standard.
By connecting Sony's PhotoTV HD-compatible devices using an HDMI cable (sold separately), a whole new world of photos can be enjoyed in breathtaking Full HD quality.
"PhotoTV HD" allows for a highly-detailed, photo-like expression of subtle textures and colors. For details, refer to the operating instructions supplied with the TV.

Features of the supplied software

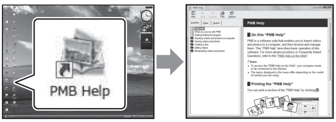
The software on the CD-ROM (supplied) allows you to do the following.

"PMB" (Picture Motion Browser) (for Windows only)

You can:
- Import images recorded with the camcorder and display them on the computer.
- Organize and view images on a computer using a calendar to sort them by shooting date.

To learn how to use "PMB"

Click the PMB Help icon displayed on the desktop after installation. Or, from the start menu, click [Start] → [All Programs] → [PMB] → [PMB Help].



The features of "PMB" are explained clearly using color images and illustrations. You can also search for information by keyword.

Preparing the computer

Recommended computer environment

The following computer environment is recommended when using the supplied software.

OS (pre-installed)	Microsoft Windows XP[1] SP3/ Windows Vista[2] SP2/Windows 7
CPU	Intel Core Duo 1.66 GHz or faster, or Intel Core 2 Duo 1.66 GHz or faster (Intel Core 2 Duo 2.26 GHz or faster to process FX 24M/FH 17M movies) However, Intel Pentium III 1 GHz or faster is sufficient for the following operations: – Importing the movies and still images to the computer – Creating a Blu-ray Disc/AVCHD disc – Copying a disc
Software	DirectX 9.0c or later (This product is based on DirectX technology. It is necessary to have DirectX installed.)
Memory	For Windows XP: 512 MB or more (1 GB or more is recommended.) For Windows Vista/Windows 7: 1 GB or more
Hard Disk	Disk volume required for installation: Approximately 500 MB (10 GB or more may be necessary when creating an AVCHD disc. 50 GB maximum may be necessary when creating a Blu-ray Disc.)
Display	Minimum 1024 × 768 dots
Others	USB port (this must be provided as standard, Hi-Speed USB (USB 2.0 compatible)), Blu-ray Disc/DVD burner (CD-ROM drive is necessary for installation) Either NTFS or exFAT file system is recommended as the hard disk file system.

[1] 64-bit editions and Starter (Edition) are not supported. Windows Image Mastering API (IMAPI) Ver.2.0 or later is required to use the function for creating discs.
[2] Starter (Edition) is not supported.

Notes
- Do not format the memory card in the camcorder from the computer. The memory card may not operate correctly.

- This camcorder captures high definition footage in the AVCHD format. Using the enclosed PC software, high definition footage can be copied onto DVD media. However, DVD media containing AVCHD footage should not be used with DVD based players or recorders, as the DVD player/recorder may fail to eject the media and may erase its contents without warning.
- Operation with all computer environments is not assured.

When using Macintosh

The supplied software "PMB" does not support Macintosh. To import the movies and still images to the computer, please contact Apple Inc.

Installing "PMB"

- Log on as an Administrator for installation.
- Close all applications running on the computer before installing the software.

1 Confirm that the camcorder is not connected to the computer.

2 Turn on the computer.

3 Place the CD-ROM (supplied) in the disc drive of the computer.
The installation screen appears.
If the screen does not appear, click [Start] → [Computer] (in Windows XP, [My Computer]), then double-click [SONYPMB(E:)] (CD-ROM)*.

* Drive figure ((E:) for example) differs depending on the computer used.

4 Click [Install].

5 Select the country/region.

6 Select the language for the application to be installed, then click [OK].

7 Confirm the license agreement, and if you accept the terms, change ○ to ◉, click [Next] → [Install].

8 Turn on the camcorder, then connect the camcorder to the computer using the USB cable (supplied).

- When the camcorder is connected to a computer, nothing appears on the LCD monitor and viewfinder. This is not a malfunction.

9 Press ▶ (Playback) on the camcorder.

10 Click [Continue] on the computer screen.

11 Follow the on-screen instructions to install the software.

- If the installation screen of other software appears, follow the on-screen instructions.
- Restart the computer if required to complete the installation.

When the installation is completed, the icons of following installed software will appear.
"PMB"
"PMB Launcher"
"PMB Help"

- Other icons may also appear.
- Icons may not appear depending on the installation procedure.

Notes

- To create discs on Windows XP, the Windows Image Mastering API (IMAPI) Ver.2.0 or later is required. If the software has not been installed, select it from the list of software required on the installation screen, and install it following the instructions displayed on the screen. You may also install the software following the message displayed when you try to start the software. Your computer must be connected to the Internet to install the software.
- Make sure that you access the camcorder from the computer using "PMB" (supplied). If you attempt to manage the files and folders in the camcorder directly from the computer, the image files may be corrupted, or may not play back.
- Make sure that you use "PMB" to import long movies or edited movies. They may not be imported correctly by other software.
- Sony is not liable for consequences resulting from managing data on the recording media in the camcorder from the computer.
- Delete image files from the recording media in the camcorder as described on page 28 or using [Delete] on the menu. Do not delete them from the computer. Sony is not liable for consequences resulting from such operations.
- Do not copy files from the computer to the recording media in the camcorder. Sony is not liable for consequences resulting from such operations.

To disconnect the camcorder from the computer

1 Click the icon at the bottom right of the desktop of the computer → [Safely remove USB Mass Storage Device].

2 Disconnect the USB cable.

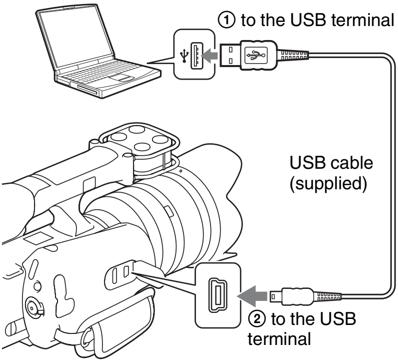
Importing images to the computer

You can import movies and still images you recorded on the camcorder to a computer. Turn on the computer beforehand.

Note

- Connect the camcorder to the wall outlet (socket) using the AC Adaptor (page 15).

1 Turn on the camcorder, and connect it to the computer using the USB cable (supplied).



- When the camcorder is connected to a computer, nothing appears on the LCD monitor and viewfinder. This is not a malfunction.

2 Press ▶ (Playback) on the camcorder.
The import screen appears on the computer.

3 Click [Import].
Movies and still images are imported to the computer. When completed, the "PMB" screen appears.
For details, refer to "PMB Help."

Tip

- You can export high definition image quality (HD) movies from the computer to the memory card in the camcorder. For details, refer to "PMB Help."

Troubleshooting

If you experience trouble with the camcorder, try the following solutions.

① Check the items on pages 33 to 35. Also refer to "Handycam" Handbook (PDF).

② Remove the battery pack, wait for about 1 minute, reattach the battery pack, then turn on the power.

③ Reset the settings (page 45).

④ Consult your Sony dealer or local authorized Sony service facility.

Battery pack and power

The battery pack cannot be attached.

- You cannot use NP-FV30/FV50.

Sufficient remaining battery indicator is displayed but the power runs out too quickly.

- This phenomenon occurs when you use the camcorder in an extremely hot or cold location.
- The battery pack is discharged. Attach a charged battery pack (page 14).
- The battery pack is dead. Replace it with a new one.

Cannot turn on the camcorder.

- Attach the battery pack correctly (page 14).
- The battery pack is discharged. Attach a charged battery pack (page 14).
- The battery pack is dead. Replace it with a new one.
- Connect the AC Adaptor to the wall outlet (wall socket) (page 15).

The power turns off suddenly.

- When the camcorder or battery pack is too warm, the camcorder displays a warning message and turns off automatically to protect the camcorder.
- If you do not operate the camcorder for 5 minutes or more, the camcorder turns to power save mode. To cancel the power save mode, operate the camcorder, such as opening/closing the LCD panel.

The CHARGE lamp flashes when charging the battery pack on the supplied battery charger.

- If you charge a battery pack that has not been used for a long time, the CHARGE lamp may flash.
- If the CHARGE lamp is flashing fast (about 0.15-second intervals)
  Remove the battery pack and reattach the same battery pack securely. If it flashes fast again, it suggests that there is something wrong with the battery pack.
- If the CHARGE lamp is flashing slowly (about 1.5-second intervals)
  The ambient temperature is outside the suitable range for charging the battery pack. Charge the battery pack under the suitable temperatures between 10 °C and 30 °C (50 °F and 86 °F).

Recording

Nothing is displayed on the viewfinder or LCD monitor when the power is turned on.

- If you do not operate the camcorder for 5 minutes or more, the camcorder turns to power save mode. To cancel the power save mode, operate the camcorder, such as opening/closing the LCD panel.
- The camcorder displays images on the viewfinder or the LCD monitor. You can switch between the viewfinder and the LCD monitor by pressing the FINDER/LCD button.

Continued ····▶

The camcorder does not start shooting when the START/STOP or PHOTO button is pressed.

- The camcorder is in the playback mode. Press the MODE button to turn on the lamp of the desired recording mode (page 22).
- The camcorder is writing the image you have just shot on the memory card. You cannot shoot new image during this period.
- There is no empty space on the memory card. Delete unnecessary images (page 28).
- Total number of movie scenes exceeds the recordable capacity of the camcorder. Delete unnecessary images (page 28).
- The lens is not attached correctly. Reattach the lens (page 16).

Recording takes a long time.

- The noise reduction function is working. This is not a malfunction.

The image is out of focus.

- The subject is too close. Check the minimum focal distance of the lens.
- You are shooting in manual focus mode. Press the FOCUS button to select autofocus mode.
- Ambient light is insufficient.
- The subject may require special focusing. Use the manual focus function.

The date and time are recorded incorrectly.

- Set the correct date and time (page 18).
- The area selected with [Area Setting] is different from the actual area. To set the actual area, press the MENU button, then select [Setup] → [Area Setting].

The aperture value and/or shutter speed flashes when you press the PHOTO button halfway down.

- Since the subject is too bright or too dark, it is beyond the available range of the camcorder. Adjust the setting again.

The image is whitish (Flare).

Blurring of light appears on the image (Ghosting).

- The picture was taken under a strong light source, and excessive light has entered the lens. When using a zoom lens, attach a lens hood.

The corners of the picture are too dark.

- Take off the filter or hood. Depending on the thickness of the filter and improper attachment of the hood, the filter or the hood may partially appear in the image. The optical properties of some lenses may cause the periphery of the image to appear too dark (insufficient light).

Dots appear and remain on the LCD monitor.

- This is not a malfunction. These dots are not recorded (page 8).

The exposure value is flashing on the LCD monitor.

- The subject is too bright or too dark for the metering range of the camcorder.

Playback

Images cannot be played back.

- The folder/file name has been changed on a computer.
- When an image file has been processed by a computer or when the image file was recorded using a model other than that of your camcorder, playback on your camcorder is not guaranteed.
- The camcorder is in USB mode. End the USB connection (page 31).

Computer

Not sure if the OS of the computer is compatible with the camcorder.

- Check “Recommended computer environment” (page 30).

The computer does not recognize the camcorder.

- Check that the camcorder is turned on.
- When the battery level is low, attach the charged battery pack, or use the AC Adaptor.

- Use the USB cable (supplied) for connection.
- Disconnect the USB cable, and connect it again firmly.
- Disconnect all equipment other than the camcorder, the keyboard and the mouse from the USB terminals of your computer.
- Connect the camcorder directly to your computer without passing through a USB hub or other device.

Others

"Recovering data. Please wait..." is indicated on the screen, and recording stops.

- Recording and deleting data has been repeated too many times on the memory card, or the memory card was formatted on another device. Save the data on the hard disk of a computer, etc., first, and then format the memory card using your camcorder (page 45).
- The writing speed of the memory card you are using is not fast enough to accommodate the recording speed of movies of your camcorder. Use one of the recommended memory cards (page 21).

Nothing appears on the LCD monitor and viewfinder of the camcorder.

- When the camcorder is connected to a computer or another device using the USB cable, nothing appears on the LCD monitor and viewfinder. This is not a malfunction. The screen turns on when the device is disconnected.

Recording time/number of images

Recording/playback time of movies of a battery pack

The table shows approximate time available using a fully charged battery pack.

(Unit: minute)

Battery pack	Continuous recording	Typical recording	Playback
NP-FV70 (supplied)	155	95	295
NP-FV100	330	205	625

- [Rec Mode] is set to [FH 17M].
- Typical recording time shows the time when you repeat recording start/stop, switching the mode lamp, etc.
- At an ambient temperature of 25 °C (77 °F). Using the battery pack in an ambient temperature of between 10 °C and 30 °C (50 °F and 86 °F) is recommended.
- The recording/playback time will be shorter at low temperatures.
- The recording/playback time may be shorter depending on the using conditions.

Estimated recording time of movies

(Unit: minute)

Rec Mode	2 GB	4 GB	8 GB	16 GB	32 GB
FX	10 (10)	20 (20)	40 (40)	90 (90)	180 (180)
FH	10 (10)	25 (25)	55 (55)	115 (115)	235 (235)
HQ	25 (20)	55 (40)	115 (80)	235 (170)	470 (340)

Notes

- The recording time will vary depending on the recording conditions and subjects.
- The figure in ( ) is the minimum recordable time.

Continued ····▶

Additional information

Recording time/number of images (continued)

Tips

- You can record movies of a maximum of 3,999 scenes.
- The camcorder can record movies for about 13 hours continuously.
- The camcorder uses the VBR (Variable Bit Rate) format to automatically adjust image quality to suit the recording scene. This technology causes fluctuations in the recording time of the memory card. Movies containing quickly moving and complex images are recorded at a higher bit-rate, and this reduces the overall recording time.

Estimated number of recordable still images

(Unit: image)

Image size	2 GB	4 GB	8 GB	16 GB	32 GB
L: 14M	300	610	1250	2550	5000

- These figures are based on the largest image size available with the camcorder. Check the actual number of recordable images on the LCD monitor during shooting (page 49).
- The number of recordable images of a memory card will vary depending on the shooting conditions.

Tips

- Bit-rate (movie + audio, etc.), number of pixels, and aspect ratio of each recording mode of movies are as follows.
  FX: max. 24 Mbps 1920 × 1080/16:9
  FH: approx. 17 Mbps (ave.) 1920 × 1080/16:9
  HQ: approx. 9 Mbps (ave.) 1440 × 1080/16:9
- Number of pixels and aspect ratio of still images
  4592×3056 dots/3:2
  4592×2576 dots/16:9
  3344×2224 dots/3:2
  3344×1872 dots/16:9
  2288×1520 dots/3:2
  2288×1280 dots/16:9

Precautions

The LCD monitor

- Images may trail across on the LCD monitor in a cold location. This is not a malfunction. When turning on the camcorder in a cold location, the LCD monitor may become temporarily dark.
- Do not press against the LCD monitor. The monitor may be discolored and that may cause a malfunction.
- While using your camcorder, the back of the LCD panel may heat up. This is not a malfunction.

Places where the camcorder should not be used or stored

- In an extremely hot, cold or humid place
  In places such as in a car parked in the sun or near a heater, the camcorder body may become deformed and this may cause a malfunction.
- In a location subject to rocking vibration
- Near strong magnetic place
- In sandy or dusty places
  If sand gets into the camcorder, the camcorder may malfunction, and in some cases this malfunction cannot be repaired.
- Near strong radio waves or radiation. The camcorder may not be able to record properly.
- Near TV, AM receivers and tuner
  Noise may occur.
- Near windows or outdoors, where the LCD monitor, the viewfinder, or the lens may be exposed to direct sunlight.
  This damages the inside of the viewfinder or the LCD monitor.

When not using the camcorder for a long time

- Be sure to attach the lens cap when not using the camcorder.
- Periodically turn on the camcorder and play back images once a month to keep the camcorder in good status for a long time.
- Use up the battery pack completely before storing it.

Operating temperatures

This camcorder is designed for use under the temperatures between 0 °C and 40 °C (32 °F and 104 °F). Shooting in extremely cold or hot places that exceed this range is not recommended.

When playing movies on other devices

- This camcorder uses MPEG-4 AVC/H.264 High Profile for AVCHD format recording. Movies recorded in AVCHD format with this camcorder cannot be played by the following devices.
  – Other devices compatible with AVCHD format that does not support High Profile
  – Devices incompatible with the AVCHD format
- Movies made using this camcorder may not play back normally on devices other than this camcorder. Also, movies recorded on other devices may not play back properly on this camcorder.

Moisture condensation

If the camcorder is brought directly from a cold to a warm location, moisture may condense inside or outside the camcorder. This moisture condensation may cause a malfunction of the camcorder.

- If moisture condensation occurs
  Turn off the camcorder and wait about an hour for the moisture to evaporate.
- What causes moisture condensation
  Moisture may condense when you bring your camcorder from a cold place into a warm place (or vice versa) or when you use your camcorder in a humid place as shown below.
  – The camcorder is brought from a ski slope into a place warmed up by a heating device.
  – The camcorder is brought from an air conditioned car or room into a hot place outside.
  – After a squall or a shower.
  – In a hot and humid place (hot spring, etc.).
- How to prevent moisture condensation
  When bringing the camcorder from a cold place to a warm place, seal the camcorder in a plastic bag and allow it to adapt to conditions at the new location over about an hour.

If recording/playback is not done correctly

If you repeatedly record/delete images, fragmentation of data may occur on the memory card. Movies may not be able to be saved or recorded. In such a case, save your images to a computer or other storage location, then format the memory card (page 45).

When the camcorder is connected to a computer, accessories, etc.

- Do not format the memory card in the camcorder from the computer. The memory card may not operate correctly.
- When connecting the camcorder to other devices using cables, make sure that you connect the proper plug in the correct direction. If you try to connect a plug forcibly, the terminal may be damaged. Also, this may cause a malfunction of the camcorder.

Optional accessories

- It is recommended that you use genuine Sony accessories with the camcorder.
- Some accessories may not be available, depending on the countries/regions.

To clean the LCD monitor

If fingerprints or dust make the LCD monitor dirty, it is recommended that you use a soft cloth to clean it.

To handle the casing

- If the casing is soiled, clean the camcorder body with a soft cloth lightly moistened with water, and then wipe the casing with a dry soft cloth.
- Avoid the following to avoid damage to the finish:
  – Using chemicals such as thinner, benzine, alcohol, chemical cloths, repellent, insecticide and sunscreen
  – Handling the camcorder with above substances on your hands
  – Leaving the casing in contact with rubber or vinyl objects for a long period of time

Continued ····▶

Care and storage of the lens

- Wipe the surface of the lens clean with a soft cloth in the following instances:
  - When there are fingerprints on the lens surface
  - After using the lens in hot or humid locations
  - When the lens is exposed to salty air such as at the seaside
- Store in a well-ventilated location subject to little dirt or dust.
- To prevent mold, periodically clean the lens as described above.

The internal rechargeable battery

This camcorder has an internal rechargeable battery for maintaining the date and time and other settings regardless of whether the power is on or off, or the battery is installed or not. This rechargeable battery is continually charged as long as you are using the camcorder. However, if you use the camcorder for only short periods, it discharges gradually, and if you do not use the camcorder at all for about 3 months it becomes completely discharged. In this case, be sure to charge this rechargeable battery before using the camcorder. However, even if this rechargeable battery is not charged, you can still use the camcorder as long as you do not record the date and time. If the camcorder resets the settings to the defaults each time you charge the battery, the internal rechargeable battery may be dead. Consult your Sony dealer or local authorized Sony service facility.

- Charging method of the internal rechargeable battery
  Attach a charged battery pack into the camcorder, or connect the camcorder to a wall outlet (wall socket) using the AC Adaptor, and leave the camcorder for 24 hours or more with the power off.

Disposal/transfer of the memory card

Even if you delete data in the memory card or format the memory card on your camcorder or a computer, you may not delete data from the memory card completely. When you give the memory card to somebody, it is recommended that you delete data completely using data deletion software on a computer. Also, when you dispose of the memory card, it is recommended that you destroy the actual body of the memory card.

This manual

- The images of the LCD monitor and the viewfinder used in this manual for illustration purposes are captured using a digital still camera, and therefore may appear different.
- The on-screen displays in each local language are used for illustrating the operating procedures. Change the screen language before using your camcorder if necessary (page 18).
- Design and specifications of the camcorder and accessories are subject to change without notice.

Specifications

Camcorder body

[Format]

Camera type
  Interchangeable Lens Digital HD Video Camera Recorder

Lens
  E-mount lens

[System]

Video signal
  HDTV 1080/50i specification
  Image pickup on the image sensor: 25 frames/second (25p)

Video recording format
  MPEG-4 AVC/H.264 AVCHD format compatible

Audio recording format
  Dolby Digital 2ch (48 kHz 16-bit)
  Dolby Digital Stereo Creator

Still image file fomat
  JPEG (DCF Ver. 2.0, Exif Ver. 2.3, MPF Baseline) compatible

Recording medium (Movie/Still image)
  "Memory Stick PRO Duo" media
  SD card (Class 4 or more)

Viewfinder
  Electric viewfinder: Color
  Screen size: 1.1 cm (0.43 type)
  Effective pixel number: 1 152 000 dots (800 × 3[RGB] × 480)

Image device
  23.4 mm × 15.6 mm (APS-C size) CMOS sensor
  Total pixel number: Approx. 14 600 000 pixels
  Effective pixel number of movie: Approx. 9 080 000 pixels (16:9)
  Effective pixel number of still image: Approx. 14 200 000 pixels (3:2)

Minimum illumination
  11 lx (lux) (Shutter speed (1/25), Gain [Auto], [F3.5])

Shutter
  Type: Electronically-controlled, vertical-traverse, focal plane type
  Shutter speed range: 1/4000 second to 30 seconds (1/3 EV step)
  Available in still image recording mode only

[Output terminals]

HDMI OUT terminal
  HDMI mini connector

Headphone jack
  Stereo minijack (Φ 3.5 mm)

[Input terminal]

MIC input jack
  Stereo minijack (Φ 3.5 mm)

[Input/output terminal]

USB
  mini-B

[LCD monitor]

Screen size
  7.5 cm (3.0 type, Aspect 16:9)

Total dot number
  921 600 (1920 (H) × 480 (V))

[General]

Power requirements
  DC 6.8 V (battery pack)
  DC 7.6 V (AC Adaptor)

Average power consumption
  Using the viewfinder with normal brightness: 4.3 W
  Using the LCD monitor with normal brightness: 4.3 W

Operating temperature
  0 °C to 40 °C (32 °F to 104 °F)

Storage temperature
  –20 °C to + 60 °C (–4 °F to +140 °F)

Dimensions (approx.)
  (w/h/d, excluding the grip belt)
  85 mm × 130 mm × 223 mm (3 3/8 in. × 5 1/8 in. × 8 7/8 in.) (camcorder body only (without lens))
  97 mm × 132 mm × 294 mm (3 7/8 in. × 5 1/4 in. × 11 1/2 in.) (including the lens and lens hood)

Mass (approx.)
  Camcorder body: 620 g (1 lb. 5 oz.) (without lens)
  When recording: 1.3 kg (2 lb. 12 oz.) (including "Memory Stick PRO Duo," and the supplied lens, lens hood, and rechargeable battery pack NP-FV70)

Continued ····▶

E-mount lens E18-200 mm F3.5-6.3 OSS (SEL18200) (supplied)

Equivalent 35 mm-format focal length[1)]
32.4 mm – 360 mm (1 5/16 in. – 14 1/4 in.) (16:9 movie)
27 mm – 300 mm (1 1/8 in. – 11 7/8 in.) (3:2 still image)
F-value
F3.5 – F6.3
SteadyShot
Optical-shift biaxial-linear-drive and hall effect sensor
Minimum focus[2)]
0.30 m (W) – 0.50 m (T) (11 7/8 in. – 19 3/4 in.)
Maximum magnification
×0.35
Minimum f-stop
f/22 – f/40
Filter diameter
67 mm (2 3/4 in.)
Dimensions (max. diameter × height)
Approx. 75.5 mm × 99.0 mm (Approx. 3 in. × 4 in.)
Mass
Approx. 524 g (Approx. 18 1/2 oz.)

1) The values for equivalent 35 mm-format focal length and angle of view are based on digital cameras equipped with an APS-C sized image sensor.
2) Minimum focus is the shortest distance from the image sensor to the subject.

Battery charger BC-VH1

Input rating
AC 100 V – 240 V, 50 Hz/60 Hz, 4 W
Output rating
DC 8.4 V, 0.28 A
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Storage temperature
–20 °C to +60 °C (–4 °F to +140 °F)
Maximum dimensions
Approx. 60 mm × 25 mm × 95 mm
(Approx. 2 3/8 in. × 1 in. × 3 3/4 in.) (w/h/d)
Mass
Approx. 75 g (Approx. 2 oz.)

AC Adaptor AC-PW10AM/AC-PW10

Power requirements
AC 100 V - 240 V, 50 Hz/60 Hz
Output voltage
DC 7.6 V[3)]
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Storage temperature
–20 °C to +60 °C (–4 °F to +140 °F)
Dimensions
Approx. 127 mm × 35 mm × 63 mm (Approx. 5 in. × 1 7/16 in. × 2 1/2 in.) (w/h/d) excluding the projecting parts
Mass
Approx. 300 g (Approx. 10 oz.) excluding the power cord (mains lead)

3) See the label on the AC Adaptor for other specifications.

Rechargeable battery pack NP-FV70

Used battery
Lithium-ion battery
Maximum output voltage
DC 8.4 V
Output voltage
DC 6.8 V
Maximum charge voltage
DC 8.4 V
Maximum charge current
3.0 A
Capacity
Typical 14.0 Wh (2 060 mAh)
Minimum 13 Wh (1 960 mAh)

Design and specifications are subject to change without notice.

- Manufactured under license from Dolby Laboratories.

On focal length

The picture angle of this camcorder is narrower than that of a 35 mm-format film camera. You can find the approximate equivalent of the focal length of a 35 mm-format film camera, and shoot with the same picture angle, by increasing the focal length

of your lens by approximately1.8 times (for movie recording)/1.5 times (for still image recording). For example, by using a 50 mm (2 in.) lens, you can get the approximate equivalent of a 90 mm (3 5/8 in.) (movie)/75 mm (3 in.) (still image) lens of a 35 mm-format film camera.

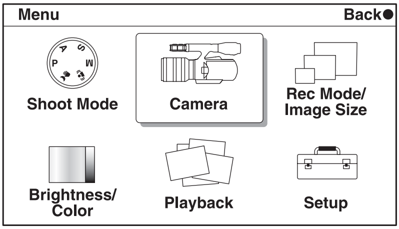
On image data compatibility

- This camcorder conforms with DCF (Design rule for Camera File system) universal standard established by JEITA (Japan Electronics and Information Technology Industries Association).
- Playback of images recorded with your camcorder on other equipment and playback of images recorded or edited with other equipment on your camcorder are not guaranteed.

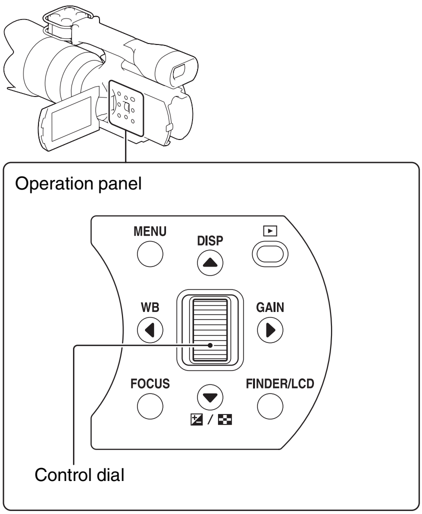
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Menu list



The 6 menu items, [Shoot Mode], [Camera], [Rec Mode/Image Size], [Brightness/Color], [Playback], and [Setup], will allow you to set various functions and customize your camcorder.
To use the menu, press MENU to display the menu, and select items using the control dial and the ▲/▼/◀/▶ buttons on the operation panel, then press the control dial to make your choice.
Items that cannot be set in the context are displayed in gray.



Shoot Mode

Allows you to select a shooting mode.

Program Auto	Allows you to customize settings, except for the exposure (shutter speed and aperture).
Hand-held Twilight*	Shoots night scenes with less noise and blur without using a tripod.
Anti Motion Blur*	Reduces the camera shake when shooting a slightly dark indoor scene or a telephoto.
Manual Exposure	Adjusts the aperture and shutter speed.
Shutter Priority	Adjusts the shutter speed to express the movement of the subject.
Aperture Priority	Adjusts the range in focus, or defocuses the background.

* Still image only

Camera

Allows you to set focusing method, continuous shooting, self-timer, etc.

AF/MF Select	Selects auto focusing or manual focusing. (Autofocus/DMF*/Manualfocus)
Autofocus Area*	Selects the area to be focused on. (Multi/Center/Flexible Spot)
Autofocus Mode*	Selects the autofocus method. (Single-shot AF/Continuous AF)
SteadyShot	Sets camera shake compensation. (Active/Standard/Off)
Drive Mode*	Selects the drive mode, such as continuous shooting, self-timer, or bracket shooting. (Single-shot Adv./Continuous Adv./Self-timer/Bracket: Cont.)
Flash Mode*	Selects the method used to fire the attached flash (sold separately). (Fill-flash/Slow Sync./Rear Sync.)
Display Contents	Switches the information to be displayed on the shooting screen. (Disp. Basic Info/Histogram/No Disp. Info.)

* Still image only

Rec Mode/Image Size

Allows you to set the recording mode of movies and the image size of still images.

Movie

Rec Mode	Selects the image quality. (FX 24M/FH 17M/HQ 9M)

Continued ····▶

Still

Image Size	Selects the image size.
Aspect Ratio	Selects the aspect ratio. (3:2/16:9)

Brightness/Color

Allows you to make brightness settings such as exposure compensation, and color settings such as white balance.

Exposure Comp.	Compensates for the brightness of the entire image. (+2 to –2)
Gain	Sets the luminous sensitivity for movie recording. (Auto/0dB to 27dB)
ISO*	Sets the luminous sensitivity for still image shooting. (ISO AUTO/200 to 12800)
White Balance	Selects the color tones according to the ambient light conditions. (Auto WB/ Daylight/Shade/Cloudy/Incandescent/Fluorescent/Flash/C.Temp./Filter/ Custom/Custom Setup)
Creative Style	Selects the image processing method. (Standard/Vivid/Portrait/Landscape/ Sunset/Black & White)
Metering Mode*	Selects the method used for measuring the brightness. (Multi/Center/Spot)
Flash Compensation*	Adjusts the light amount of the attached flash (sold separately). (+2 to –2)
DRO/Auto HDR*	Corrects the brightness or contrast automatically. (Off/D-Range Opt./Auto HDR)

* Still image only

Playback

Allows you to set playback functions.

Delete	Deletes images. (Multiple Movies/Multiple Still Images)
Movie/Still Select	Selects a movie or still image to play back. (Movie/Still)
Image Index	Selects the number of images to be displayed on the index screen. (6 Images/12 Images)
Protect	Protects images, or cancels the protection. (Multiple Movies/Cancel All Movies/Multiple Still Images/Cancel All Images)
Still Slide Show*	Plays back still images automatically. (Repeat/Interval)
Enlarge Still image*	Enlarges the still image.
Display Contents	Switches the information to be displayed on the playback screen. (Disp. Basic Info/Disp. Detail Info/No Disp. Info.)

* Still image only

Setup

Allows you to make more detailed shooting settings, or change the camcorder settings.

Shooting Settings

Movie Audio Rec	Sets whether or not to record the sound for movie recording. (On/Off)
Grid Line	Turns on the grid line that helps you to adjust the composition of images. (On/Off)
Shoot w/o Lens	Sets whether or not to record images when there is no lens. (Enable/Disable)
Red Eye Reduction*	When using a flash (sold separately), prevents eyes from being shot in red. (On/Off)
Auto Review*	Shows the image right after shooting. (2 Sec/Off)

* Still image only

Main Settings

Volume Settings	Sets the sound volume of movies.
Beep	Sets the sound produced when you operate the camcorder. (On/Off)
Language	Selects the language used on the screen.
Date/Time Setup	Sets the date and time. (year-month-day/Date Format/Daylight Svg.)
Area Setting	Selects the area where you are using the camcorder.
Power Save	Turns the camcorder to the power save mode. (5 Min/Off)
LCD Brightness	Sets the brightness of the LCD monitor. (–2 to +2)
Viewfinder Bright.	Sets the brightness of the viewfinder. (–1 to +1)
Cleaning Mode	Allows you to clean the image sensor.
Version	Displays the version of the camcorder and the lens.
Demo Mode	Sets whether or not to use the recorded movie for the demonstration. (On/Off)
Reset Default	Resets the camcorder to the factory-settings.

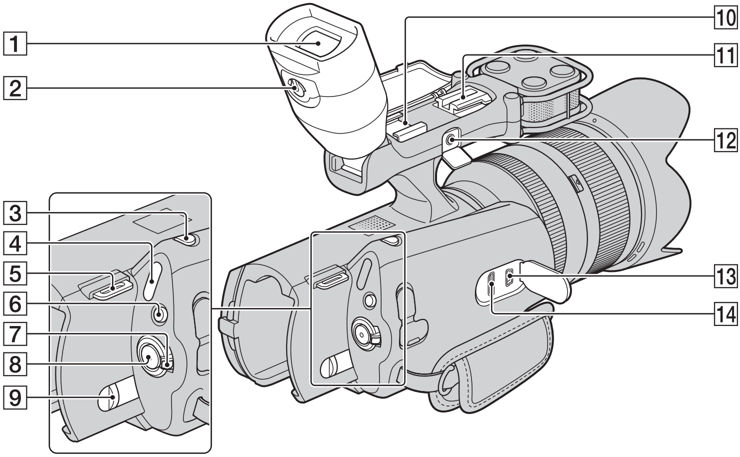
Memory Card Tool

Format	Formats the memory card.
Recover Image DB	Repairs the image database file of movies when inconsistencies are found.
File Number*	Selects the method used for assigning file numbers to images. (Series/ Reset)

* Still image only

Identifying parts

The numbers in ( ) are reference pages.



1 Viewfinder (20)

2 Viewfinder lens adjustment lever (20)

3 PHOTO button (23)

4 (movie)/(still image) lamps (22)

5 Hook for shoulder strap (47)

6 MODE button (23)

7 ON/OFF (power) switch (18)

8 START/STOP button (22)

9 BATT (battery release) lever (15)

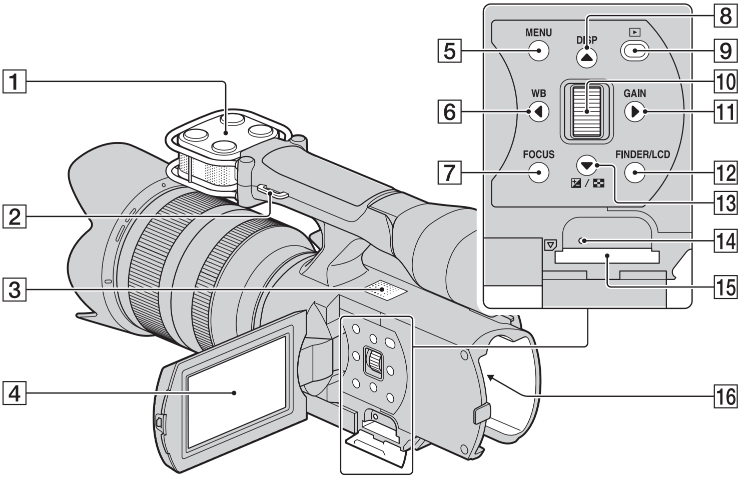
10 Accessory shoe
Attach a gun microphone (sold separately), etc. If you attach accessories to the accessory shoe and auto lock accessory shoe simultaneously, the accessories may collide with each other and be damaged.

11 Auto lock accessory shoe
Attach a Sony external flash (sold separately), etc.
The flash does not fire when [Anti Motion Blur], [Hand-held Twilight], [Continuous Adv.] or [Bracket: Cont.] is set. There are certain Sony flashes or functions that cannot be used with your camcorder. For the compatibility of a particular flash unit, visit the Sony web site in your area, or consult your Sony dealer or local authorized Sony service facility.

12 MIC (external microphone) jack
When an external microphone (sold separately) is connected, it takes precedence over the built-in microphone.

13 (USB) terminal (32)

14 HDMI terminal (29)
No image is displayed on the viewfinder and LCD monitor when signals are output via the HDMI terminal.



1 Microphone (13)

2 Hook for shoulder strap

3 Speaker

4 LCD monitor (20)

5 MENU button (24, 42)

6 WB/◀ button (25, 42)

7 FOCUS button (25)

8 DISP/▲ button (24, 42)

9 ▶ (Playback) button (28)

10 Control dial (26, 42)

11 GAIN/▶ button (25, 42)

12 FINDER/LCD button (20)

13 (Exposure Comp.)/ (Image Index)/ ▼ button (25, 42)

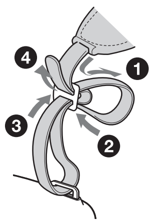
14 Access lamp (21)

15 Memory card slot (21)

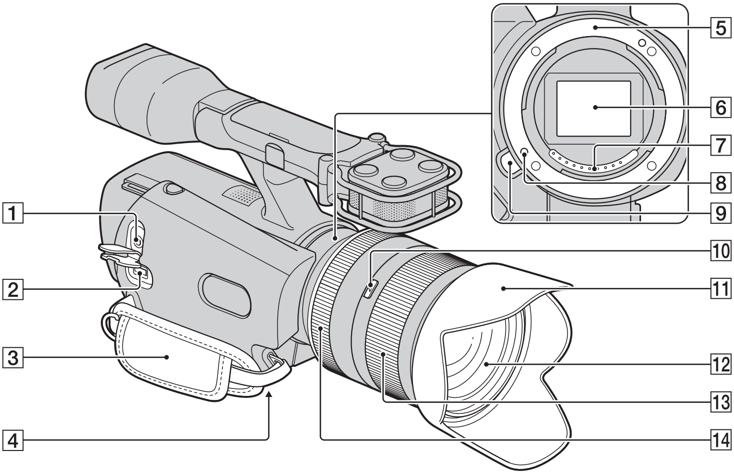
16 Battery terminal (14)

To attach a shoulder strap

Attach a shoulder strap (sold separately) to the hooks for shoulder strap.



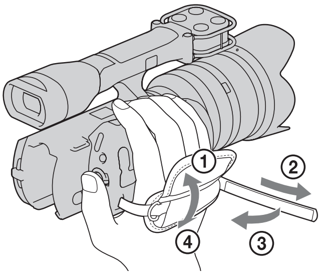
Continued ····▶



1 🎧 (headphones) jack
Use stereo minijack headphones.

2 DC IN jack (15)

3 Grip belt
Fasten the grip belt as shown below.



4 Tripod receptacle
Attach a tripod with the screw length of less than 5.5 mm (7/32 in.) (sold separately).

5 Mount (16)

6 Image sensor

7 Lens contacts
Do not touch or dirty the lens contacts.

8 Lens lock pin

9 Lens release button (17)

10 Zoom lock switch (24)

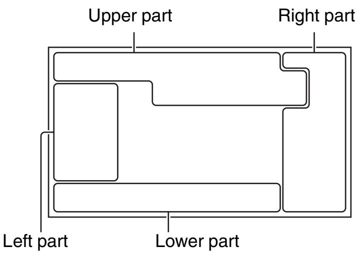
11 Lens hood (12)

12 Lens (16)

13 Zoom ring (24)

14 Focusing ring (24)

List of icons



Upper part

P A S M	Exposure mode
	Anti Motion Blur
	Hand-held Twilight
L M S L M S	Image size/aspect ratio of still images
100	Number of recordable still images
FX FH HQ	Image quality of movies
	Memory card
123 Min	Estimated recordable time of movies
	Remaining battery
OFF	Does not record sound during movie recording
	Camera shake warning
	Overheating warning
FULL ERROR	Database file full/Database file error
	Histogram
101-0012	Playback folder – file number
	Protect
STBY/REC	Recording status
00:00:00	Counter (hour:minute:second)

Left part

SLOW REAR	Flash mode/Red Eye Reduction
10 2 BRK C 0.3EV BRK C 0.7EV	Drive mode
AF DMF MF AF-S AF-C	Focus mode
±0.0	Flash compensation
	Metering mode
GAIN AUTO	Gain
ISO AUTO	ISO
AWB WB 7500K	White Balance
Std. Vivid Port. Land. Sunset B/W	Creative Style
D-R OFF DRO AUTO HDR AUTO	DRO/Auto HDR
	Flash charge in progress

Lower part

	Focus status
1/125	Shutter speed
F3.5	Aperture value
±0.0	Exposure compensation
2010-1-1 9:30AM	Recorded data/time of the image
12/12	Image number/Number of images recorded in the date or folder
OFF	SteadyShot off
HDR !	Appears when HDR did not work on the image

Continued ····▶

List of icons (continued)

Right part

Soft key	See page 19.

- Indicators and their positions are approximate and may differ from what you actually see.

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